

## Epinephrine Dosing Interval and Survival Outcomes During Pediatric In-Hospital Cardiac Arrest

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**Background:** American Heart Association (AHA) guidelines recommend administration of epinephrine (epi) every 3 to 5 minutes during CPR to improve systemic blood pressure and coronary perfusion pressure. In adults with in-hospital cardiac arrest (IHCA), longer dosing intervals are associated with improved survival to hospital discharge. The purpose of this study is to investigate whether longer epi dosing intervals are associated with improved survival to hospital discharge after pediatric IHCA.

**Methods:** A retrospective review of the AHA Get With The Guidelines-Resuscitation registry identified 1,260 pediatric IHCA events that met our inclusion criteria: index IHCA event; no vasoactive infusion in place or alternate vasoactive medication boluses; > 1 dose of epi administered; not located in delivery room, nursery, NICU or obstetrical units. For each arrest, an epi dosing interval was defined by dividing the duration of resuscitation after the first dose of epi by the total doses given. This was necessary as the database does not provide time of individual epi doses. For analysis, epi dosing intervals were categorized as 1 to <5 minutes/dose, 5 to <8 minutes/dose, and 8 to 10 minutes/dose. Multivariable logistic regression models were constructed controlling for age, gender, illness category, location of arrest, and arrest duration to evaluate the relationship of epi dosing intervals on survival to discharge. Odds ratios were calculated using the 1 to <5 minutes/dose interval as the reference.

**Results:** Table 1 displays the descriptive characteristics of the patients and subsequent events. Adjusted odds ratio for survival to hospital discharge for dosing interval of 5 to <8 minutes was 1.454 (95% CI 1.014-2.084) and for 8 to 10 minutes was 1.945 (95% CI 1.094-3.459).

**Conclusions:** Longer dosing intervals than those currently recommended by the AHA guidelines for epinephrine administration during pediatric IHCA are associated with improved survival to hospital discharge.

**Table 1: Baseline characteristics of 1,260 pediatric in-hospital cardiac arrest events by categories of epinephrine average dosing period†.**

	Epinephrine average dosing interval (min/dose)			p-value
	1-5 min/dose (n=813)	5-8 min/dose (n=350)	8-10 min/dose (n=97)	
Age (years)	4.52 (5.76)	4.34 (5.96)	3.34 (5.42)	0.4669
Male gender	485 (59.7)	198 (56.6)	56 (57.7)	0.4889
Illness category				<b>0.0341</b>
Medical cardiac	147 (18.2)	76 (21.7)	21 (21.7)	
Surgical cardiac	133 (16.5)	62 (17.7)	18 (18.6)	
Medical noncardiac	414 (51.2)	169 (48.3)	39 (40.2)	
Surgical noncardiac	69 (8.6)	34 (9.7)	17 (17.5)	
Trauma	44 (5.5)	9 (2.6)	2 (2.0)	
Location of arrest				<b>0.0088</b>
Intensive care	656 (80.6)	252 (72.0)	78 (80.4)	
Ward	111 (13.7)	75 (21.4)	17 (17.5)	
Ward with telemetry	46 (5.7)	23 (6.6)	2 (2.1)	
Arrest characteristics				
Unwitnessed	64 (7.9)	27 (7.7)	2 (2.1)	0.0789
First pulseless rhythm				<b>&lt;0.0001</b>
Asystole	250 (30.8)	109 (31.1)	23 (23.7)	
Pulseless Electrical Activity	238 (29.3)	112 (32.0)	19 (19.6)	
Ventricular Fibrillation	49 (6.0)	14 (4.0)	15 (15.5)	
Ventricular Tachycardia	39 (4.8)	24 (6.9)	9 (9.3)	
Unknown	237 (29.1)	91 (26.0)	31 (31.9)	
Weekend event	246 (30.3)	94 (26.9)	26 (26.8)	0.5916
Night time event	254 (31.6)	116 (33.2)	40 (41.2)	0.2285
Treatment characteristics				
Time to 1 <sup>st</sup> epinephrine dose (min)	2.78 (6.16)	2.72 (4.62)	3.11 (4.52)	0.9580
Arrest duration (min)	19.37 (17.84)	39.05 (23.61)	47.72 (32.51)	<b>&lt;0.0001</b>

†Data are presented as mean (standard deviation) or frequency (percentage) as appropriate